

### **IN THE CLAIMS**

Please amend the claims as follows:

1. (Previously Presented) An anti-arrhythmia system, comprising:  
a detection circuitry for sensing atrial fibrillation in a heart;  
a stimulus generator for delivering, in response to sensed atrial fibrillation, independently controlled stimulus through each of at least two electrodes for attaching to a target atrium; and  
electronic circuitry for deactivating delivery of stimulus through all of the electrodes in response to the detection circuitry detecting the termination of atrial fibrillation and then placing the anti-arrhythmia system in an atrial fibrillation suppression mode that then delivers multiple pulses to the target atrium during the same atrial contraction, wherein the suppression mode delivers the multiple pulses timed to suppress circus conduction in the target atrium to prevent onset of atrial fibrillation without causing contraction of the target atrium.
2. (Previously Presented) The anti-arrhythmia system of claim 1, wherein the suppression mode delivers the multiple pulses concurrently to the target atrium during the same atrial contraction.
3. (Previously Presented) The anti-arrhythmia system of claim 1, wherein the suppression mode delivers the multiple pulses sequentially to the target atrium during the same atrial contraction.
4. (Previously Presented) The anti-arrhythmia system of claim 1, wherein the suppression mode delivers the multiple pulses timed to induce a faster-than-native atrial contraction to prevent onset of atrial fibrillation.
5. (Cancelled)

6. (Previously Presented) The anti-arrhythmia system of claim 1, wherein the stimulus generator can deliver a stimulus that is a train of pulses through at least one electrode, the train of pulses configured to suppress onset of atrial fibrillation.

7. (Previously Presented) The anti-arrhythmia system of claim 6, wherein each stimulus in the train of pulses is biphasic.

8. (Currently Amended) An anti-arrhythmia system for suppressing the onset of atrial fibrillation, comprising:

~~electronic circuitry for detecting the cardiac cycle of a target atrium; and~~  
~~a stimulus generator having at least two independently-controllable stimulation channel outputs adapted to be coupled to at least two electrodes attached to the target atrium;~~  
~~wherein the electronic circuitry for detecting the cardiac cycle is responsive to atrial contraction and is in communication with the stimulus generator that can deliver timed stimulation through each of the at least two electrodes to suppress the onset of atrial fibrillation.~~  
detection circuitry for sensing atrial fibrillation in a heart;  
a stimulus generator for delivering, in response to sensed atrial fibrillation, independently controlled stimulus through each of at least two electrodes for attaching to different locations of a target atrium; and  
electronic circuitry for placing the anti-arrhythmia system in an atrial fibrillation suppression mode that then delivers multiple pulses to the target atrium during the same atrial contraction, wherein the suppression mode delivers the multiple pulses including first and second pulses, wherein the second pulse is offset from the first pulse by a specified offset time duration that suppresses circus conduction in the target atrium to inhibit atrial fibrillation without causing a separate contraction of the target atrium.

9. (Previously Presented) The anti-arrhythmia system of claim 8, wherein the stimulus generator is configured to deliver, in an atrial fibrillation suppression mode, stimuli,  $S_1, S_2 \dots S_N$ , concurrently to N number of electrodes, where N is 2 or greater, such that occurrence of  $S_1$  and  $S_2$  either completely or partially overlap in a time duration,  $S_2$  and  $S_3$  either completely or

partially overlap in a time duration, and so on, such that  $S_{N-1}$ , and  $S_N$  either completely or partially overlap in a time duration.

10. (Original) The anti-arrhythmia system of claim 9, wherein at least one of the stimulus delivered at one electrode is a train of pulses.

11. (Previously Presented) A method comprising:  
attaching at least two electrodes on one atrium;  
detecting atrial fibrillation;  
delivering an independently settable stimulus through each of the at least two electrodes to stop the atrial fibrillation;  
detecting the cessation of atrial fibrillation;  
deactivating the delivery of stimulus to each of the at least two electrode, in response to the cessation of atrial fibrillation; and  
delivering, in response to the cessation of atrial fibrillation, stimulation through each of the at least two electrodes, the stimulation timed to suppress the onset of atrial fibrillation, including delivering multiple pulses timed to suppress circus conduction in the target atrium to prevent onset of atrial fibrillation without causing contraction of the target atrium.

12. (Previously Presented) The method of claim 11, wherein the delivering, in response to the cessation of atrial fibrillation, comprises delivering multiple pulses concurrently to the target atrium during the same atrial contraction.

13. (Previously Presented) The method of claim 11, wherein the delivering, in response to the cessation of atrial fibrillation, comprises delivering multiple pulses sequentially to the target atrium during the same atrial contraction.

14. (Previously Presented) The method of claim 11, wherein the delivering, in response to the cessation of atrial fibrillation, comprises delivering multiple pulses timed to induce a faster-than-native atrial contraction to prevent onset of atrial fibrillation.

15. (Cancelled)

16. (Currently Amended) A method of suppressing the initiation of atrial fibrillation, the method comprising:

~~detecting the onset of an atrial contraction at the target atrium using a sense electrode;~~

~~and~~

~~delivering, in response to the detecting the onset of the atrial contraction, independently settable stimulus through each of at least two electrodes attached to the target atrium to suppress the initiation of atrial fibrillation in the target atrium without causing contraction of the target atrium;~~

detecting atrial fibrillation using at least two electrodes associated with different locations of one atrium;

delivering an independently settable stimulus through each of the at least two electrodes to stop the atrial fibrillation;

detecting the cessation of atrial fibrillation;

deactivating the delivery of stimulus to each of the at least two electrode, in response to the cessation of atrial fibrillation; and

delivering, in response to the cessation of atrial fibrillation, stimulation through each of the at least two electrodes, the stimulation timed to inhibit atrial fibrillation, comprising delivering multiple pulses including first and second pulses delivered during the same atrial contraction, wherein the second pulse is offset in time from the first pulse by a duration that is timed to suppress circus conduction in the target atrium to inhibit atrial fibrillation without causing a separate contraction of the target atrium.

17. (Previously Presented) The method of claim 16, wherein the delivering, in response to the detecting the onset of the atrial contraction, comprises delivering multiple pulses concurrently to the target atrium during the same atrial contraction.

18. (Previously Presented) The method of claim 16, wherein the delivering, in response to the detecting the onset of the atrial contraction, comprises delivering multiple pulses sequentially to the target atrium during the same atrial contraction.

19. (Previously Presented) The method of claim 16, wherein the delivering, in response to the detecting the onset of the atrial contraction, comprises delivering multiple pulses timed to induce a faster-than-native atrial contraction to prevent onset of atrial fibrillation.

20. (Currently Amended) A method for both pacing the atrium and suppressing the initiation of atrial fibrillation, the method comprising;

providing at least two electrodes configured to be attached to different locations of a target atrium for independently delivering stimulus through the at least two electrodes

sensing cardiac activity using a sense electrode to determine when the atrium should be paced; and

delivering a timed sequence of stimulus pulses through each of the at least two electrodes to contract the atrium, wherein the time sequence includes first and second pulses delivered during the same atrial contraction, wherein the second pulse is offset in time from the first pulse by a duration that is timed to suppress occurrence of a circus conduction in the target atrium without causing a separate contraction of the target atrium such that the resulting atrial contraction is completed faster than the atrium's native contraction, thereby forestalling initiation of conduction circus motions.

21. (Previously Presented) The method of claim 20, wherein the delivering the timed sequence comprises delivering multiple pulses concurrently to the target atrium during the same atrial contraction.

22. (Previously Presented) The method of claim 21, wherein the delivering the timed sequence comprises delivering multiple pulses sequentially to the target atrium during the same atrial contraction.